## REMARKS/ARGUMENTS

Claims 1-21 were pending. Claims 1-21 were variously rejected under 35 USC §102(b) by Gagne (U.S. 5,731,819) and 35 USC §103(a) by Gagne in view of Weiley.

## I. THE PRESENT INVENTION

Embodiments of the present invention relate to methods and apparatus for squash and stretch of multiple objects. Particular aspects of the present invention were previously discussed. One particular aspect was illustrated in Figs. 7A-7C.

Figs. 7B-C illustrates that the arm was squashed (or stretched) according to various embodiments while at the same time the arm was constrained. As can be seen, the cross-section of the arm at the elbow in Fig. 7B increased in response to the arm being shortened; and the cross section of the arm at the elbow in Fig. 7C decreased in response to the arm being lengthened. In these examples, the arm was constrained at the end of the arm connected to the hand and was constrained at the end of the arm connected to the shoulder. As can be seen, these constraints allow the arm to be squashed or stretched, while not affecting objects (e.g. hand, shoulder) connected to the arm.

Further examples of constraints on end portions of an object in response to a squash or stretch in one dimension are illustrated in numerous figures, such as Figs. 6A-6E. As can be seen, the object in Fig. 6A includes end portions 630 and 640. In response to control point 620 being moved to the right or left, the object is squashed in Figs. 6B and 6D, and the object is stretched in Fig. 6C and 6E. As can also be seen, the cross-section of the object at various locations can change at various cross-sections (e.g. increases or decreases in height) throughout its length to preserve volume of the object to some degree:

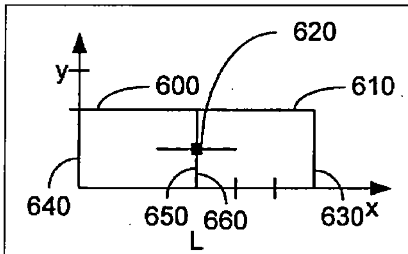



FIG. 6A

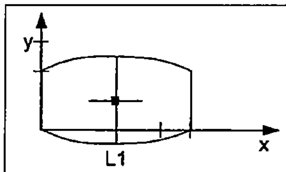



FIG. 6B

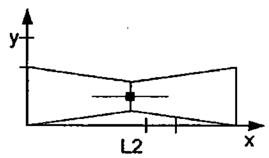



FIG. 6C

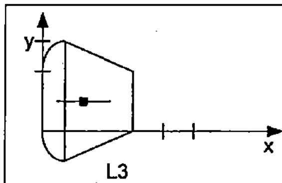



FIG. 6D

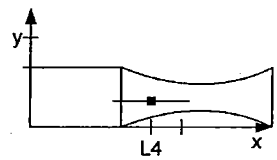



FIG. 6E

The above aspect is believed to be recited in claim 1 which recites, in part: automatically scaling the first three-dimensional object in a first dimension by a first amount in response to the offset of the control indicator; automatically modifying at least a cross-section of the first three-dimensional perpendicular to the first dimension in at least a second dimension in response to the offset of the control indicator, in response to the associated first volume, and in response to a constraint; and wherein the constraint comprises having a size and a shape of a first end of the first three-dimensional object being equal to a size and a shape of a first end of the modified first three-dimensional object.

## II. GAGNE

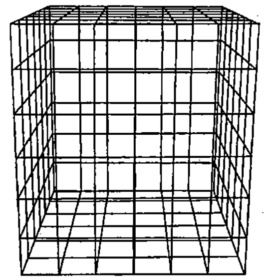
Gagne relates to simulating the effects of motion via graphic object deformation. Various limitations of Gagne were previously discussed.

On the surface, it appears that the "stretch" function described in Gagne is within the same "ballpark" as embodiments of the present invention, thus will be discussed. However, Gagne's stretch function is very limited in functionality.

Gagne describes the stretch functionality as elongating an object in a direction of motion and making the object become thinner in other directions. Specifically Gagne states:

> *The stretch deformation serves another purpose. Typically, in cartoons, a "squash and stretch" effect is applied, causing an object to appear to elongate in the direction of a motion and become thinner in the other directions. Col. 6,l.7-11.*

Examples of this are illustrated in Figs 12-15, where a static object in Fig. 7 is stretched in length (in the dimension of motion) in Figs. 12 and 14, and is squashed in length (in the dimension of motion) in Figs. 13 and 15:



STATIC
*FIG. 7*

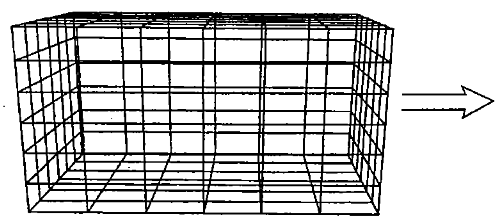
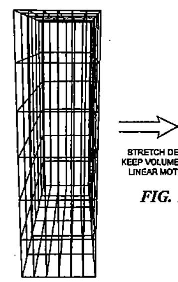


*FIG. 12* STRETCH DEFORMATION, KEEP VOLUME (POSITIVE SENS.), LINEAR MOTION VECTOR



STRETCH DEFORMATION, KEEP VOLUME (NEG. SENS.), LINEAR MOTION VECTOR
*FIG. 13*

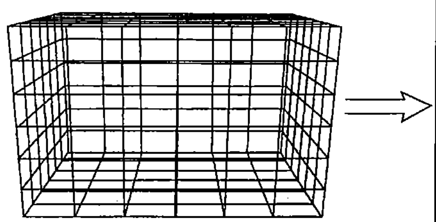
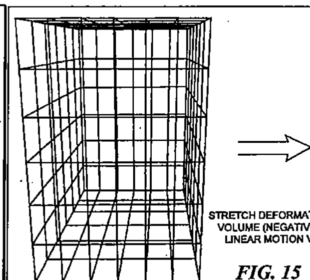


*FIG. 14* STRETCH DEFORMATION, FREE VOLUME (POSITIVE SENS.), LINEAR MOTION VECTOR



STRETCH DEFORMATION, FREE VOLUME (NEGATIVE SENS.), LINEAR MOTION VECTOR
*FIG. 15*

As can be seen in the Figs. 12-15, Gagne simply discloses elongating or shortening of an object in the dimension of motion. As can be seen <u>the end portions of the object change in size</u>, and are not constrained. Additionally, as can be seen, the object has <u>a uniform increase or decrease in other dimensions of the object along its length</u>. More specifically, each of the cross-sections of the solid rectangles in Fig. 12 are the same along the length of the object; each of the cross-sections of the solid rectangles in Fig. 13 are the same along the length of the object; each of the cross-sections of the solid rectangles in Fig. 14 are the same along the length of the object; etc.

None of the options for a stretch function contemplates a non-uniform increase or decrease in the other dimensions of the object. As illustrated in Fig. 6B, a number of options (e.g. 118, 130, 132, 134, 146, 154) for the stretch functionality 110, are shown:

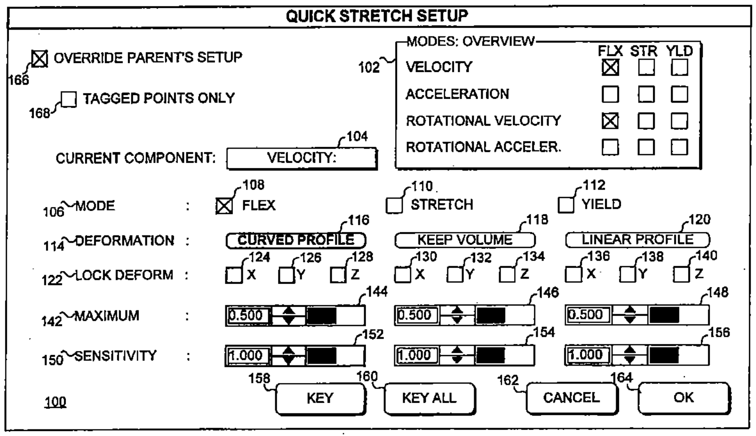



*FIG. 6B*

In Gagne, option 118 allows the user to select whether the stretch object maintains constant volume or not. Specifically:

> *The stretch effect can be set to a Keep Volume Constant option in a text box 118, or alternatively, can be set to a Free Volume option. Col. 8, l.20-22.*

Additionally, options 130-134 allow the user to exclude the object from being modified in the selected dimension. In other words, the selected dimension(s) of the object are not modified for the entire object. Specifically:

> *The stretch deformation can be excluded from the X, Y, and/or Z axis by entering a check in one or more of check boxes 130, 132, or 134, respectively. Col. 8, l.32-35.*

Further, option 146 allows the user to limit the deformation on the object. In other words, this option allows the stretched or squashed length of the object to be limited. Specifically:

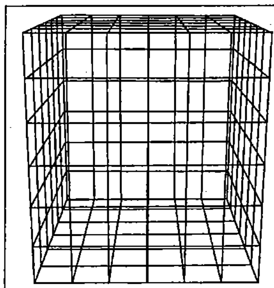
> *For this reason, a Maximum line 142 enables the user to separately set the maximum deformation for any of the three effects related to the current motion component in blocks 144, 146, and 148, respectively. Col. 8, l.46-49.*

Still further, option 154 allows the user to change the sensitivity of the stretch in response to the motion. In other words, this option determines how much stretch or squash is used for a user-given object motion. Specifically:

> *The values entered within blocks 152, 154, and 156 in this line, for the flex, stretch, and yield effects, determine how sensitive each of these deformation effects will be relative to the current object's motion component. Col. 8, l.55-58.*

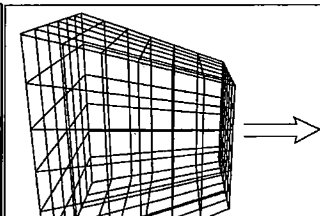
Accordingly, Gagne describes the stretch functionality as elongating an object in a dimension of motion and uniformly increasing or decreasing the object size in the other dimensions.

The "yield" function in Gagne is not relevant to the present discussion. In contrast to the stretch function, with a yield function, the length of an object is not lengthened or decreased in a dimension in response to object motion in that dimension. Instead, Gagne merely describes a "yield" function as simulating movement of mass within an object when being pushed or pulled. Additionally, with a yield function, the end portions of the object are not constrained in size. As seen in the examples in Figs. 20-21, in response to a yield, the leading end portion of the object becomes smaller, and the trailing end portion of the object becomes larger.



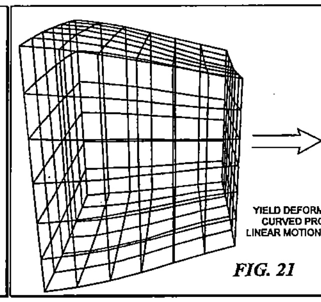
STATIC

*FIG. 7*



YIELD DEFORMATION, LINEAR PROFILE, LINEAR MOTION VECTOR

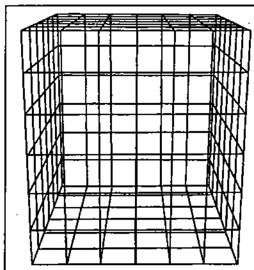
*FIG. 20*



YIELD DEFORMATION, CURVED PROFILE, LINEAR MOTION VECTOR

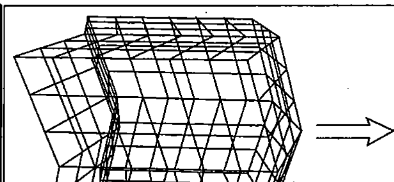
*FIG. 21*

The "flex" function in Gagne is also not relevant to the present discussion. In contrast to the stretch function, a flex function as simulating bending or flexing of an object in a direction opposite to a motion. Additionally, with a flex function, the end portions of the object are not constrained in size. Still further, as can be seen, the object is not modified in other dimensions of the object along its length. As seen in the examples in Figs. 7-8, in response to a flex, the leading end portion of the object is flexed, and the trailing end portion of the object is flexed.



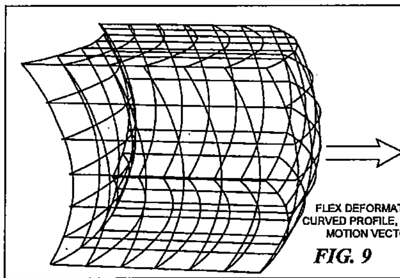
STATIC

*FIG. 7*



FLEX DEFORMATION, LINEAR PROFILE, LINEAR MOTION VECTOR

*FIG. 8*



FLEX DEFORMATION, CURVED PROFILE, LINEAR MOTION VECTOR

*FIG. 9*

Although Gagne discloses being able to have combinations of stretch, yield, and flex at the same time, no combination can provide an effect where the end portion of the object are constrained in size and shape while the object is not constrained in cross-section along its length.

III. GAGNE DISTINGUISHED

A. Claim 1

Claim 1 is not anticipated by Gagne. More specifically, the yield function of Gagne fails to disclose the limitation of automatically scaling the first three-dimensional object in a first dimension by a first amount in response to the offset of the control indicator.

As discussed above, the yield function does not change the length of the object in the direction of motion. Instead, the yielded object maintains the same length.

Additionally, the flex function of Gagne fails to disclose automatically modifying at least a cross-section of the first three-dimensional perpendicular to the first dimension in at least a second dimension in response to the offset of the control indicator, in response to the associated first volume, and in response to a constraint. Instead, the flexed object maintains the exact same size across the length of the object.

Further, the yield, flex, and stretch functions of Gagne all fail to disclose the limitation of wherein the constraint comprises having a size and a shape of a first end of the first three-dimensional object being equal to a size and a shape of a first end of the modified first three-dimensional object.

As illustrated above, in each of the functions provided by Gagne, the end portions of the object all change from the static model, Fig. 7. Specifically, for a yield function, one end of an object increases, and the other end of the object decreases; for a flex, one end of the object is concaved, and the other end of the object is convex; and for a stretch, both ends increase in size or decrease in size.

In light of at least the above, claim 1 is not anticipated by Gagne.

B. Remaining Claims

Dependent claims 2-9 are asserted to be allowable for substantially the same reasons as claim 1, and more particularly, for the specific limitations they recite.

Independent claim 10 and 17 are asserted to be allowable for substantially the same reasons as claim 1, and more particularly, for the specific limitations it recites.

Dependent claims 11-16 are asserted to be allowable for substantially the same reasons as claim 10, and more particularly, for the specific limitations they recite.

Dependent claims 18-21 are asserted to be allowable for substantially the same reasons as claim 17, and more particularly, for the specific limitations they recite.

## CONCLUSION

In view of the foregoing, the Undersigned believes that all of the issues raised by the Examiner have been responded to by this response. Applicants believe all claims now

pending in this Application are in condition for allowance. The issuance of a formal Notice of Allowance at an early date is respectfully requested.

If the Examiner believes a telephone conference would expedite prosecution of this application, please telephone the undersigned at (650) 326-2400.

Respectfully submitted,

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